

What Is Claimed Is:

1. An optical integrated circuit, comprising:

 a substrate;

 a plurality of dies;

5 a template layer attached to a top side of the substrate
for aligning the dies by contacting the dies during placement of
the dies on the template layer and substrate.

2. The optical integrated circuit of Claim 1, wherein optical

10 the integrated circuit is a mirror array and the dies are mirror
sub-arrays.

3. The optical integrated circuit of Claim 1, wherein the
template layer has rectangular apertures for accepting the
15 plurality of dies.

4. The optical integrated circuit of Claim 1, wherein the
template layer has protrusions perpendicular to the mounting
surface of the substrate for guiding the dies during placement.

20

5. The optical integrated circuit of Claim 4, wherein the
protrusions are tapered, having a narrow end farthest from the
substrate, so that the dies may self-align as the dies are
guided toward the substrate.

6. The optical integrated circuit of Claim 5, wherein the template layer has rectangular apertures for accepting the plurality of dies, and wherein walls of the rectangular apertures are formed by the protrusions.

5

7. The optical integrated circuit of Claim 1, further comprising an adhesive layer for attaching the dies to the substrate, and wherein the adhesive layer is cut to provide vents to permit the escape of gas during mounting of the dies.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

10 8. The optical integrated circuit of Claim 1, wherein the substrate has perforations for permitting the escape of gas during mounting of the dies.

15 9. The optical integrated circuit of Claim 1, wherein the template layer is bonded to the substrate by an eutectoid layer.

10. The optical integrated circuit of Claim 1, wherein the template layer is an epitaxially grown semiconductor layer.

20

11. The optical integrated circuit of Claim 1, wherein the template layer is an etched metal layer.

12. The optical integrated circuit of Claim 1, wherein the template layer is a stamped metal layer.

13. An optical integrated circuit, comprising:

5 a substrate;
a plurality of dies;
means for aligning the dies during placement of the dies on
the template layer and substrate.

10 14. A template for aligning dies on a substrate, comprising a
layer of material having rectangular apertures for receiving the
dies.

15 15. The template of Claim 14, wherein the material layer has
protrusions perpendicular to a bottom surface for mounting on
the substrate, wherein the protrusions provided for guiding the
dies during placement.

20 16. The template of Claim 15, wherein the protrusions are
tapered, having a narrow end farthest from the bottom surface,
so that the dies may self-align as the dies are guided toward
the substrate.

17. The template of Claim 14, comprising an epitaxially grown semiconductor layer.

18. The template of Claim 14, comprising an etched metal layer.

5

19. A method for manufacturing an optical integrated circuit, the method comprising:

mounting a template to a substrate; and

placing dies within apertures of the template.

10

20. The method of Claim 19, wherein the placing comprises guiding a die by contacting protrusions at the edges of an aperture.

15 21. The method of Claim 20, wherein the guiding is effected by sliding the die along a tapered surface of one or more of the protrusions.

22. The method of Claim 19, further comprising applying an
20 adhesive to the dies to attach them to the substrate.

23. The method of Claim 19, further comprising venting gases underneath the dies through gaps in the adhesive.

24. The method of Claim 22, further comprising venting gases underneath the dies through holes in the substrate.

25. The method of Claim 19, further comprising epitaxially
5 growing the template from a semiconductor material.

26. The method of Claim 19, further comprising etching the template from a metal.